Notice of Allowability	Application No.	Applicant(s)	
	10/620,734	ASAAD ET AL.	
	Examiner	Art Unit	
	Lev I. Iwashko	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *6/13/2006*.

2. ☒ The allowed claim(s) is/are *1-21*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 3/18/2004
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Response to Amendment

1. Formal drawings (Figures 1-7) have been substituted for the previous informal drawings. The new drawings are now in compliance with 37 CFR 1.121(d), and the objections to the drawings are withdrawn.

2. The amendments made to Claims 1, 8, 10, and 16 have been considered.

3. Claims 1-21 are now in condition for allowance.

Allowable Subject Matter

4. Claim 1-21 are allowed.

5. The following is an examiner's statement of reasons for allowance:

The applicant chose to make amendments to independent Claims 1, 8, 10, and 16, so that they would each include the elements of the already determined patentable material presented in Claims 20-21. As stated in the previous first office action, Claim 20 and 21 are respectively "A method of changing states of a dynamic loop buffer (DLB) controller having four states" and "A computer program device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for a method of changing states of a dynamic loop buffer (DLB) controller having four states". The rest of claims 20 and 21 are identical, so it is acceptable to only reference the items in the claims once for the duration of this explanation.

The rest of the claims reads as follows: "to enable limiting a use of energy in a computing device having a processor, a DLB, and the DLB controller, while said computing device is performing instruction memory storage and processing using backwards branch control information, the method comprising the steps of: in a FILL state fetching instruction packets

from a primary memory unit, writing a copy of said instruction packets into a DLB, setting a valid bit to assert validity of said DLB, entering an ACTIVE state when a backward branch is taken within a range of a loop, entering an IDLE state when said backward branch completes a loop and a change of flow branch is taken out of range of said loop, and entering an OVERFLOW state if the DLB fills up and said change of flow branch is not taken; in the ACTIVE state presenting instruction fetches to the DLB, entering the IDLE state if said backward branch is not taken and a change of flow branch is taken out of range, entering the FILL state if the buffer is not full, if said backward branch is within the loop, entering an OVERFLOW state if the buffer is full, entering the FILL state if the buffer is full, and entering the OVERFLOW state if the end of the buffer is reached said and change of flow branch is not taken; in the OVERFLOW state reading instruction data packets from a primary memory unit of said computing device, entering the IDLE state after performing a jump or a branch instruction out of range of said loop; entering the ACTIVE state if said backward branch is taken, entering the ACTIVE state if a backward branch within the range of said loop is taken and data is valid, and entering the FILL state if a backward branch within the range of said loop is taken and data is invalid; and in the IDLE state accessing instruction data packets from the primary memory unit, entering the FILL state if a new backward branch is detected, and entering the ACTIVE state if a last loop captured in the dynamic loop buffer is repeated."

Since every state (FILL, IDLE, OVERFLOW and ACTIVE) is so well-defined in a step-by-step fashion, there is great difficulty in finding prior art that will object to the entirety of the claim. Even by combining the prior art of Hansen et al. (US Patent 5,742,840), Yoshida et al. (US Patent 6,205,536), Lee et al. (US Patent 6,401,196) and Dayan (US PGPub 2004/0268047),

it is not possible to overcome every aspect of claims 20 and 21. For instance, none of the prior art mentions "change of flow" or "entering the ACTIVE state if a last loop captured in the dynamic loop buffer is repeated".

Therefore, claims 20 and 21 are allowed due to their specific nature and because they both overcome obviousness.

Furthermore, Amended Claims 1, 8, 10, and 16 are either systems or methods embodying the same components/steps, with the addition of having the novel materialfrom Claims 20-21 presented above.

Therefore, Claims 1, 8, 10, 16, and 20-21 (and all depended claims 2-7, 9, 11-15, and 17-19 that rely on these independent claims) are allowed.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lev I. Iwashko whose telephone number is (571)272-1658. The examiner can normally be reached on 9 Hours Schedule), from 8-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (571)272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lev Iwashko

MATTHEW KIM
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